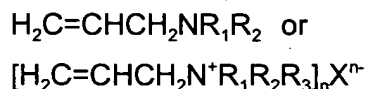


What is claimed is:

1. An process for the electrodeposition of a nickel or nickel-alloy coating on a substrate, the process comprising:

immersing the metal substrate in a bath comprising nickel ions and an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting or hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

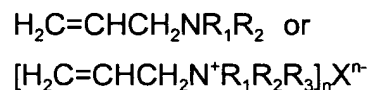
2. The process according to claim 1 wherein  $\text{X}^{n-}$  is an n-valent anion selected from the group of chloride, bromide, fluoride, sulfate, acetate, and tetrafluoroborate.

3. The process according to claim 1 wherein the bath further comprises alloying metal alloys.

4. An aqueous acidic plating bath for the electrodeposition of a nickel or nickel alloy deposit on a substrate comprising:

a) nickel ions; and

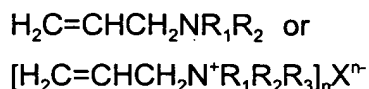
b) an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting or hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

5. An aqueous acidic plating bath for the electrodeposition of a nickel or nickel alloy deposit on a substrate comprising:

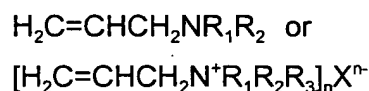
- a) nickel ions;
- b) at least one Class I brightener; and
- c) an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting of hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

6. An aqueous acidic plating bath for the electrodeposition of a nickel or nickel alloy deposit on a substrate comprising:

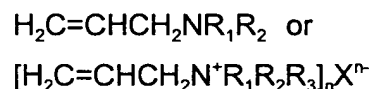
- a) nickel ions;
- b) at least one Class II brightener; and
- c) an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting of hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

7. An aqueous acidic plating bath for the electrodeposition of a nickel or nickel alloy deposit on a substrate comprising:

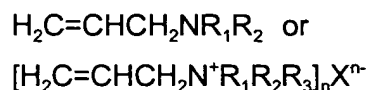
- a) nickel ions;
- b) at least one Class I brightener;
- c) at least one Class II brightener; and
- d) an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting of hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

8. An aqueous acidic plating bath for the electrodeposition of a nickel or nickel alloy deposit on a substrate comprising:

- a) nickel ions;
- b) alloying metal ions;
- c) at least one Class I brightener;
- d) at least one Class II brightener; and
- e) an additive having the general formula:



wherein  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are selected from the functional groups consisting of hydrogen, methyl, ethyl, propyl, allyl, propyn, propanediol and combinations thereof; and  $\text{X}^{n-}$  is an n-valent inorganic or organic anion.

9. The bath according to claim 8 wherein the alloying metal ions are selected from the group of iron, cobalt, tin, and zinc.

10. The bath according to claim 4 wherein  $\text{X}^{n-}$  is an n-valent anion selected from the group of chloride, bromide, fluoride, sulfate, acetate, and tetrafluoroborate.